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Review assessment and management of the asbestos problem at United Nations Headquarters

Report of the Secretary-General

Summary

In paragraphs 187 and 188 of General Assembly resolution 54/249, of 22 December 1999, the Secretary-General was requested to prepare a detailed and comprehensive report addressing the asbestos problem in United Nations Headquarters buildings, including specific proposals in the proposed programme budget for the biennium 2000-2001 aimed at addressing the situation. The present report provides an assessment of existing conditions with regard to asbestos-containing materials at Headquarters and a review of measures and procedures being followed in order to ensure that the presence of such materials has no harmful effect on the health of delegates, staff members or other persons working in and visiting the buildings

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I. Introduction

1. Asbestos is a naturally occurring class of magnesium-silicate minerals which are light-weight, chemically inert and heat-resistant, do not conduct electric currents, and possess high flexibility, strength, durability, and acoustic properties. Due to such excellent physical characteristics, asbestos-containing materials (ACM)[1] were widely adopted for various industrial and commercial uses, including building construction.

2. It was common practice, until the early 1970s, to use asbestos-containing materials in homes and buildings as thermal insulation on piping and ductwork, as electrical insulation on cables and panels, as a vapour barrier on exterior walls, as sprayed-on water-proofing or acoustic treatment on walls, ceilings and structural elements, and as a strengthening compound for certain vinyl floor tiles. ACM were also used extensively in the brake and clutch linings of cars and in various textured paints and adhesives; in caulking, glazing and patching compounds; in varnish, fire-resistant papers and clothing, and in home appliances.

3. Under a microscope, asbestos particles appear to be composed of thin curly fibers, much thinner than human hair. Because the fibers are so thin, once airborne, they can hang in the air for long periods of time before settling.

4. The adverse health effects associated with exposure to asbestos have been extensively studied for many years. Results of these studies and of epidemiologic investigations have demonstrated that inhalation of asbestos fibers over a long period of time may lead to increased risk of respiratory problems or lung cancer. Smoking in combination with exposure to asbestos fibers compounds the risk.

5. The harmful effects of asbestos fibers on the respiratory system was clearly established by the early 1970s, and hence, in 1972, the use of any sprayed-on asbestos in building elements was banned. Soon thereafter, the use of other asbestos-containing materials in buildings was also banned. Therefore, buildings constructed after 1980 have no ACM, while buildings constructed after 1972 may have limited amounts of ACM.

6. Buildings with ACM today use extensive monitoring, engineering controls and work practices to ensure that the risk of exposure to asbestos fibers is minimized.

7. It is important to note that the majority of people who have developed a disease as a result of exposure to asbestos have been asbestos workers, frequently exposed to very high concentrations of asbestos fibers every working day, with little or no protection.

II. Friable and non-friable asbestos-containing materials

8. Friable ACM can be crumbled with hand pressure; if disturbed, they can therefore release fibers into the air. The extent to which an asbestos-containing material might release harmful, breathable fibers into the air depends on its existing degree of friability or the friability created by a cutting or handling process.

9. The United States Environmental Protection Agency (EPA), Occupational Health and Safety Administration (OSHA) and National Institute of Occupational Safety and Health (NIOSH) and other New York State and New York City regulatory agencies have established that only friable ACM has the potential of releasing asbestos fibers into the air and thereby posing a risk to the occupants of buildings.

10. Under the host country environmental and occupational safety and health rules and regulations, ACM that are not disturbed and that would not be disturbed by the performance of a staff member's regular job functions or routine building operations and maintenance functions are considered encapsulated, or non-friable. Encapsulated asbestos cannot release asbestos fibers into the air, does not pose a health risk and is best left undisturbed.

III. Current situation at United Nations Headquarters

11. The buildings at United Nations Headquarters complex, which were constructed in the early 1950s, used asbestos-containing materials on the following surfaces and in the following building systems:

(a) Hot and cold water piping, steam piping and piping in the window heating and cooling units;

[1] For a glossary of terms, see the annex.

(b) On the outside of sealed air supply, return and exhaust ductwork;

(c) Spray-on vapour barriers or fireproofing on certain exterior walls;

(d) Spray-on or trowled-on acoustic/fireproofing on non-metallic plaster ceilings with popcorn texture;

(e) Vinyl floor tiles;

(f) Electrical insulation material on certain cables and connectors.

12. The ACM in the United Nations Headquarters buildings are mostly "white asbestos" (chrysotile), with small amounts of "brown asbestos" (amosite).

13. The UNDC-I and UNDC-II buildings do not contain any asbestos-containing materials since they were constructed when use of such materials was already discouraged.

14. Leased spaces in other Headquarters buildings are inspected for asbestos-containing materials, and proper abatement or containment procedures are followed prior to occupancy.

15. Based on regular inspections and air-quality testing, which is conducted twice yearly, all known asbestos-containing materials in Headquarters buildings are in an encapsulated, or non-friable, condition and are known to pose no health risk to staff, delegates or visitors to the United Nations.

16. If any asbestos-containing material might become disturbed or friable as the result of any activity such as planned maintenance, alteration, improvement or construction, it is removed from all adjacent areas by licensed contractors who use proper engineering controls and monitoring measures to ensure that permissible safe exposure limits are not exceeded.

17. It would not be possible to remove all the asbestos-containing materials from United Nations Headquarters buildings without vacating and isolating multiple floors and shutting down and rebuilding systems and interior surfaces.

IV. Compliance with industry codes, regulations and standards

18. The United Nations complies with all standards, codes and regulations issued by the United States Government, New York State and New York City with regard to inspection, engineering controls, abatement, and management of disposal of asbestos-containing materials. These include:

(a) United States Environmental Protection Agency (EPA), Code of Federal Register (CFR) (40 CFR 763) for asbestos hazard emergency response and for workers protection;

(b) Occupational Safety and Health Administration operations and maintenance standards (29 CFR 1910.1001); construction industry standards (29 CFR 1926.1101);

(c) New York State Environmental Protection Agency rules and regulations;

(d) New York City Department of Environmental Protection rules and regulations.

V. Use of licensed contractors for handling ACM and of in-house staff for supervision and management

19. Any contractor engaged by the United Nations to monitor, remove, inspect, test or dispose of ACM is required to hold the proper licences and certification and to have trained his/her staff for such work. The contractor is supervised to ensure that he/she takes all necessary precautions in accordance with applicable regulations for the construction of a decontamination unit, protection of property, monitoring, and safe and prompt disposal of asbestos-containing materials.

20. The following asbestos removal, monitoring and disposal activities may be undertaken by the contractor:

(a) Class I: Asbestos removal from piping, ductwork and surfaces;

(b) Class II: Asbestos removal from areas other than class I areas, such as floor tiles, wall boards etc.;

(c) Class III: Repair or maintenance activities where ACM or presumed ACM (PACM) are likely to be disturbed. The contractor removes ACM from all adjacent surfaces before starting the repair or maintenance work.

21. All ACM are bagged in impervious wetted bags, hauled by a licensed transport company and deposited at a licensed landfill with proper disposal manifest.

22. Air quality is monitored by an independent testing company and laboratory to ensure that the airborne asbestos fibers do not exceed permissible safe exposure limits (PELS).

23. In-house staff are employed for the following asbestos-related activities:

(a) Supervision of outside contractors. All ACM work is supervised by the in-house staff to ensure that proper procedures and precautions are taken in building isolation/decontamination units, the installation of critical barriers to trap asbestos fibers, the maintenance of negative pressure, high efficiency particulate air (HEPA) filtration, and proper disposal of ACM bags;

(b) Periodic inspections, to ensure that no ACM become friable;

(c) Class IV ACM activities – that is, maintenance and custodial activities during which employees may come into contact with but not disturb ACM.

VI. Current measures for the management of ACM

24. In spite of the fact that there are asbestos-containing materials in the Headquarters buildings, proper inspection, management and control measures have been instituted to ensure that such materials remain in an encapsulated (non-friable) state whereby they pose no health risk to the staff, delegates or visitors.

25. If there is any chance that ACM might become friable due to an activity such as maintenance, alteration, improvement or construction, they are promptly removed (abated) and disposed of off-site by a qualified licensed contractor. The quality of the air is measured before, during and after the removal of the ACM to detect the presence of any asbestos fibers. Engineering controls and air-quality testing are used to confirm that no contamination occurs as a result of ACM abatement activities.

26. The following measures, in complete conformity with building industry standards and guidelines for asbestos management, are taken to protect United Nations staff, delegates and visitors from exposure to asbestos fibers:

(a) Semi-annual testing of all air supply and return sources for the presence of any asbestos fibers. The results are made available to the staff through the Medical Services Division/Office of Human Resources Management;

(b) Additional bulk-material testing and air-quality testing for the presence of asbestos fibers in any areas where asbestos-containing materials are suspected of having been disturbed or where specific staff complaints are received;

(c) Regular inspections by the Facilities Management Division/OCSS staff and its contractors of any areas where the ACM or PACM appear disturbed. Immediate material and air-quality testing of such areas is undertaken, and if the ACM are confirmed to be disturbed, immediate encapsulation or abatement of the disturbed materials is performed;

(d) Scheduling of air monitoring and asbestos abatement in any area where planned maintenance work, alterations, or other such activity could possibly disturb ACM;

(e) Retaining licensed contractors on board, available on short notice for air-quality testing and for isolation and abatement of any ACM that is disturbed for any reason;

(f) Periodic training of the maintenance, construction and security staff on asbestos awareness.

27. The proper supervision of contractors is provided by qualified staff to ensure that the contractors take all the necessary precautions for the abatement and management of ACM, including:

(a) Construction of a decontamination enclosure and critical barrier so as to prevent any asbestos fibers from escaping from the abatement area;

(b) Isolation of all heating, ventilation and air conditioning (HVAC) supply and return systems by use of 6-mil plastic or the equivalent;

(c) Maintenance of negative pressure in the decontamination enclosure;

(d) Use of impervious drop cloths over all equipment and surfaces in the area of ACM abatement;

(e) Use of HEPA filters for all clean-up activities. The use of compressed air or regular vacuum cleaners is prohibited;

(f) Use of wet methods (requiring the use of water) during the removal, bagging, storage and transport activities. No dry cutting, sweeping or bagging is permitted. The ACM must be stored in impervious bags and promptly hauled away by a licensed contractor to a certified landfill from which a proper waste manifest is obtained.

VII. Current resources and programme for the management of ACM

28. For the 2000-2001 biennium, US$ 1 million has been budgeted for the management of asbestos in accordance with the above procedures, with continued encapsulation and the removal of existing ACM only where maintenance work, alterations, improvements, construction or similar activities necessitate such action. Similar funding was provided in the past few biennia and was adequate for the programme.

29. Expert consultants are periodically engaged to assess the environmental situation at United Nations Headquarters buildings. The consultants have consistently found that the existing testing and abatement programmes are adequate and that no additional preventive or corrective action is necessary. Consistent with such findings and applicable regulatory rules and standards, the total removal of encapsulated ACM without moving staff from multiple floors and rebuilding systems and services is not recommended, required or planned.

30. There are no known adverse effects on the health and safety of the staff, delegates and visitors so long as the above procedures are properly followed.

VIII. Long-range plan for removal of all or most ACM through the capital master plan

31. A long-range capital master plan for extensive renovation of Headquarters buildings has been developed and will be presented to the legislative bodies this year. If and when the funding for such a plan is approved and the plan is implemented, a near-total removal of all asbestos-containing materials would be undertaken. The plan entails relocation of staff and other services from multiple floors in a phased manner. Afterwards, all occupied spaces in the Headquarters buildings would be free of ACM.

IX. Conclusion

32. The United Nations Headquarters buildings were built when the use of asbestos-containing materials was common for thermal insulation of piping and ductwork, for fireproofing/acoustic treatment of walls and ceilings, for strengthening vinyl floor tiles and for electrical insulation. All ACM in Headquarters buildings are currently maintained in a non-friable, or encapsulated, state by inspections, testing and engineering controls. Any ACM that might become friable during an activity such as maintenance, alteration, improvement or construction are removed or encapsulated, on an as-needed basis, in accordance with proper safety, monitoring and control measures

33. There has been adequate funding provided in the current and previous biennia to manage the required asbestos management and control programme. Industry standards and guidelines indicate that the practice of removing asbestos materials only when a planned or unplanned activity could disturb the material and leaving the rest of encapsulated ACM alone is the recommended option for occupied buildings and has been found to pose minimum risk to the health and safety of the occupants.

34. Under the proposed extensive buildings renovation programme in the capital master plan, when staff would be relocated from multiple floors, complete removal of all ACM from occupied spaces would be undertaken. The timetable for such complete removal would follow the schedule for implementation of phased renovations in accordance with the capital master plan.

Annex

Glossary

Asbestos. Generic name for a class of naturally occurring magnesium-silicate minerals that found wide acceptance as a choice material for high durability, insulating, fire-resistance and sound-proofing properties.

White asbestos. Chrysotile (magnesium silicate hydrate); 95 per cent of all asbestos used in the United States.

Brown asbestos. Amosite (ferrous magnesium silicate); used in places in the United States and in United Nations Headquarters buildings for its high heat resistance.

Blue asbestos. Crocidolite (sodium iron silicate); used mostly in Europe

Green asbestos. Anthophyllite and tremolite (magnesium-iron/calcium silicate); used mostly in Europe.

Asbestos-containing materials (ACM). Any material containing more than 1 per cent of asbestos.

Asbestos fiber. A particle form of asbestos 5 micrometres long or longer, with the length of the particle being three or more times that of the diameter.

Critical barrier. One or more layers of plastic sealed over all openings into a work area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a work area from migrating to an adjacent area.

Employee notification of monitoring results. Notification of results to affected employees is required within 15 days of receipt of results.

Encapsulated, or non-friable, asbestos. The state of asbestos-containing materials when they are properly sealed, wrapped and contained so that they do not crumble by hand pressure and do not pose any risk of releasing asbestos fibers into the air during the normal course of daily activities or during routine servicing, custodial and cleaning activities. Encapsulated materials do not pose a health risk unless they are disturbed by cutting, sanding or handling processes.

Engineering controls and work practices. Isolation, ventilation, cleaning and other measures to ensure that airborne asbestos fibers always remain within the permissible exposure limits or excursion limits before, during or after any asbestos handling, disposal, abatement or cleaning activities.

Excursion limit. An airborne concentration of asbestos of 1.0 fiber per cubic centimetre of air (1 f/cc), as averaged over a sampling period of thirty (30) minutes.

Exposure monitoring. General determination of employee exposure shall be made from breathing zone air samples that are representative of a 30-minute short-term or 8-hour time-weighted average.

Friable asbestos. Asbestos that can be crumbled with hand pressure and can therefore readily release fibers into the air, if disturbed. The potential for an asbestos-containing material to release harmful, breathable fibers into the air depends on its existing degree of friability or the friability created by any cutting or handling process.

High efficiency particulate air (HEPA) filter. Filters capable of trapping 99.97 per cent of particles 0.3 micrometres in diameter.

Permissible exposure limits (PELS). Airborne concentration of asbestos fibers in excess of 0.1 fiber per cubic centimetre of air as an 8-hour time-weighted average.

Presumed asbestos-containing materials (PACM). Thermal insulation or surfacing material found in buildings constructed before 1980. Unless otherwise proven by tests, such insulation or surfacing materials are presumed to contain asbestos. Buildings constructed in the United States after 1980 did not use ACM.

Regulated area. An area where ACM abatement is planned.

Surfacing ACM. Surfacing materials that are sprayed on, trowled-on or otherwise applied to walls, ceilings or other surfaces for fireproofing, acoustic treatment and other purposes and which contain more than 1 per cent asbestos.

Thermal system insulation ACM (TSI ACM). Thermal system insulation materials that contain more than 1 per cent asbestos and are applied to pipes, fittings, tanks, ducts or other components to prevent heat loss or gain.

Wet methods. To prevent the release of asbestos fibers into the air space, all asbestos-containing materials are required to be handled, removed, cut, scored, or otherwise worked in a wet state.